Cairo University

Faculty of Veterinary Medicine

Department of Microbiology

Some Studies On Probiotics On Humoral And Cellular Immunity In Poultry

A thesis presented by

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(Bachelor Degree of Veterinary Sciences, 2003)

For the Master Degree in Veterinary Medical Sciences

Microbiology
(Bacteriology, Immunology and Mycology)

Under the Supervision of

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Chief researcher and head of Immunology Department,
Animal Health Research Institute, Dokki, Giza.

(2015)

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيم

قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا مَا

عَلَّمْتَنَا إِنَّكَ أَنْتَ الْعَلِيمُ الْحَكِيمُ

صَدَقَ اللهُ الْعَظِيم

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Supervision sheet

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Degree: M.V.Sc. in Veterinary Medical Science.

Specification: Microbiology (Bacteriology, Immunology and Mycology)**.**

Thesis title: Some studies on probiotics on humoral and cellular immunity in Poultry.

Abstract

This study aimed to investigate the immuno-modulatory effect of a commercial probiotic (**Bactocell)**® in broiler chickens through investigating the relationship between in vitro phagocytosis by monocyte macrophage with in vivo pathogen clearance and antibody production which providing a new parameter to improve disease resistance in poultry .

A total number of 260 one day old SASSO chicks were divided into 2 experiment in the study experiment I a total of 160 one day broiler chickens were divided into 4 equal groups G (1) chickens served as negative control G (2) chickens were fed on commercial ration supplemented with probiotic (Bactocell) 1 Kg / ton G (3) chickens were fed on commercial ration supplemented with probiotic (**Bactocell)**® 1 Kg / ton and vaccinated with NDV and inactivated H5N1 Avian influenza (AI) vaccines G (4) chickens were vaccinated with NDV and inactivated H5N1 Avian influenza (AI) vaccine. Experiment II was conducted to evaluate the impact effect of probiotic in chickens experimentally infected with *S.* Enteritidis a total of 100 chickens of 29 days of age were divided into 4 equal groups G (A) chickens served as negative control G (B) chickens were fed on commercial ration supplemented with probiotic (Bactocell) 1 Kg / ton G (C) chickens infected with *S.* Enteritidis orally at 29 day of age in a single dose (10^8 CFU /ml) in

0.2 ml phosphate buffer saline G (D) chickens fed on commercial ration supplemented with probiotic and infected with *S.* Enteritidis. The results showed that probiotics supplementation stimulate both humoral and innate immune response. Chickens supplemented with probiotic & vaccinated (G3) showed significant increase in HI titers against NDV at 5^{th} weeks compared to vaccinated chickens and were higher in HI titers against (AI) at 21 days post-vaccination among groups. Lysozyme activity revealed significant increase in probiotic chickens versus non treated ones at 1^{st} and 5^{th} weeks of age. Chicken supplemented with probiotic (G2) showed significant increase in phagocytic % of macrophage at 1^{st}, 2^{nd} and 5^{th} weeks, also phagocytic index at 1^{st}, 2^{nd}, 5^{th} weeks compared to control. Chicken infected with *S.* Enteritidis (G) C showed significant decrease in phagocytic % and index at 7, 14 and 21 days post infection compared with control (G) A, while chickens supplemented with probiotic & infected with *Salmonella* (G) D showed significant increase phagocytic % and phagocytic index at 7 and 21 days post infection compared to *S.* Enteritidis group (G) C. Interdigital skin test showed non-significant change in experiment I among groups while in experiment II chickens supplemented with probiotic (G) B showed significant increase in skin thickness at 24 hr. compared to chickens infected with *S.* Enteritidis (G) C. Protection rate against challenge with NDV reached 90 % in chickens supplemented with probiotic & vaccinated while chickens vaccinated only revealed 60 % protection rate. It was concluded that probiotic **(Bactocell)®** proved to be able implement humoral and innate immune response and have a potent immuno-modulatory effect in chickens beside another effect in inhibition or reduction of *S.* Enteritidis count in infected poultry.

Key words :(probiotics- chickens- humoral immunity- cellular immunity- *Salmonella*).

Dedication to

My mother,

MY father,

My beloved husband

Shereif,

My children

&

My brothers and my sister

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